MATHS PATHWAY

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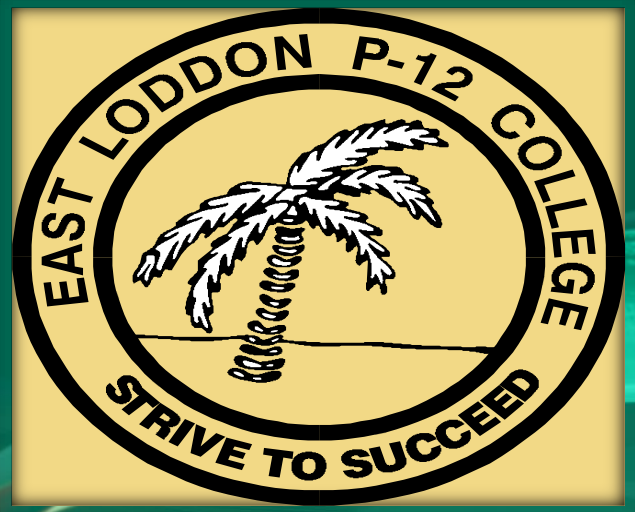


MATHS PATHWAY – WHAT IS IT?

Online mathematics teaching tool

- **Comprised of:**
  - **level based learning modules,**
    - **written,**
    - **voice and**
    - **video instructions**
  - **tests**
  - **diagnostics**

- **Used as:**
  - Knowledge map
  - Planning tool
  - Data source

STUDENTS:

Initially students complete diagnostic tasks to ascertain their level

Expectation for each fortnightly cycle:

- Complete 6 modules
- Workbook
- Revision/notes book
- Test
- Updated diagnostic if required
  - (i.e. if student thinks work is too easy/hard)

TEACHERS:

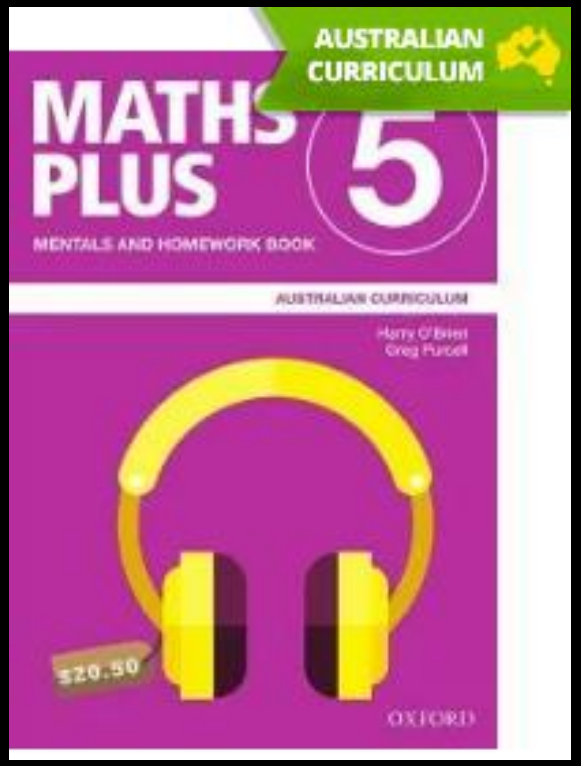
Review data including:

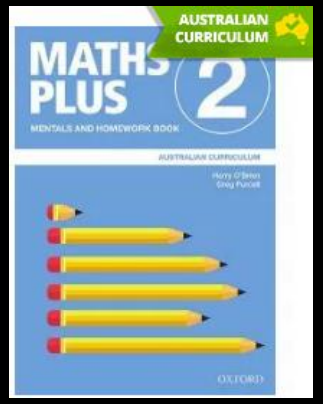
- Student levels
- Work completed
- Accuracy, growth
- Identify areas of difficulty
  - i.e. attempts to complete a module

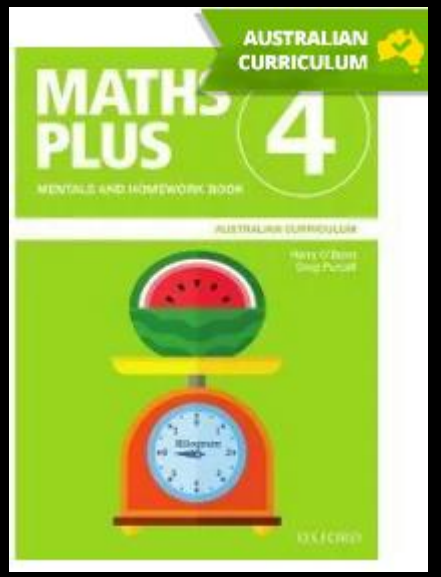
Use information including modules that are available / not yet completed to plan student learning tasks

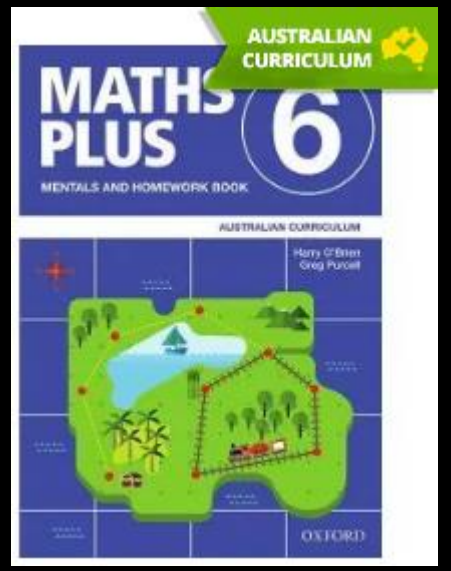
"DIFFERENTIATION" IN THE PAST:

- In many classes – Year level – "at" or "+" or "-"









"ASSESSMENT" IN THE PAST:

Please work on test provided

- What data is available?
- When?
- What groupings will be done?
- Who is at what level?
- What work will the student do?
  - Now?
  - Next?

"MATHS PATHWAY ASSESSMENT"

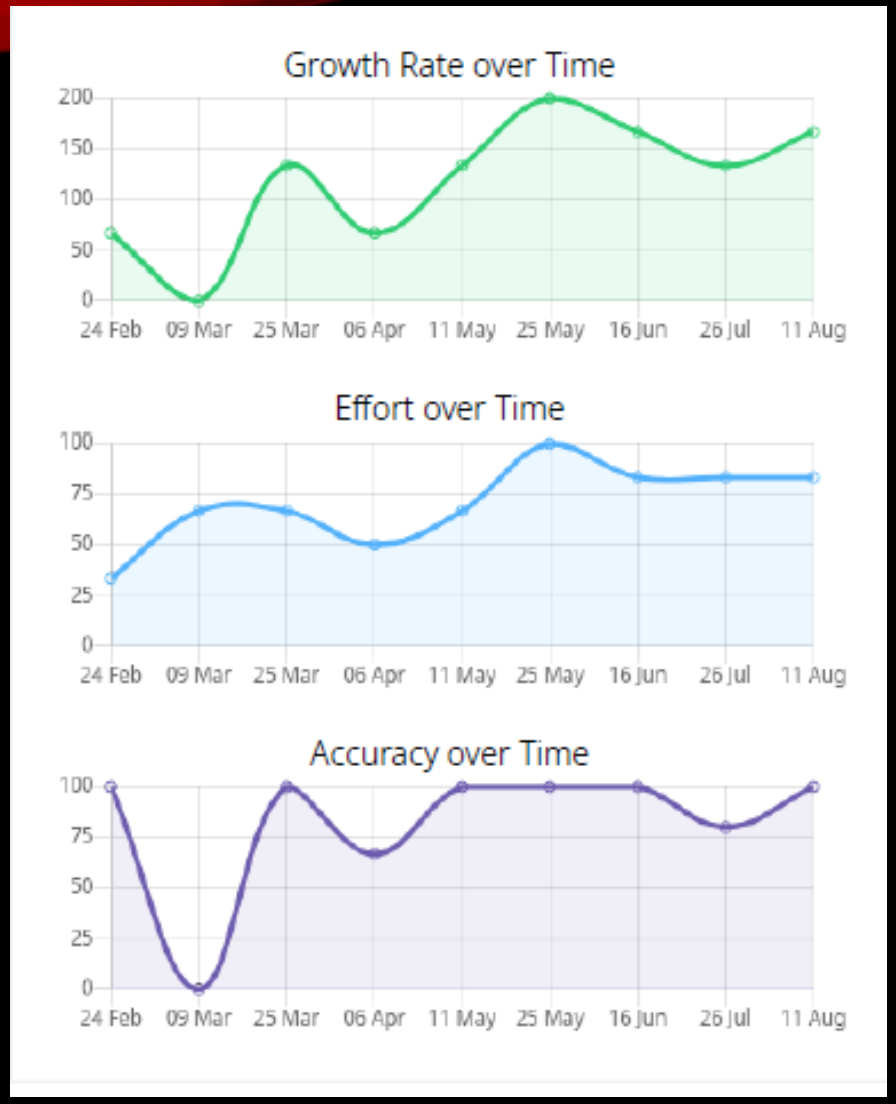
Students complete their module/test/diagnostic.

- What data is available? – LOTS (we'll see in a moment)
- When? - Instantly
- What groupings will be done? – teacher choice, program choice
- Who is at what level? – look at data - strand
- What work will the student do?
  - Now? – next available module, student/teacher choice
  - Next? – gaps/area of need

SOME OF THE AVAILABLE DATA

- Current student/class levels
- What students are currently working on,
- What they have completed
- Difficulties
- Strengths
- Available modules
- Possible intervention required
- Mini lesson / targeted learning groups
- Vic Curriculum level
- Growth
- Effort
- Projected pathways

SOME OF THE AVAILABLE DATA



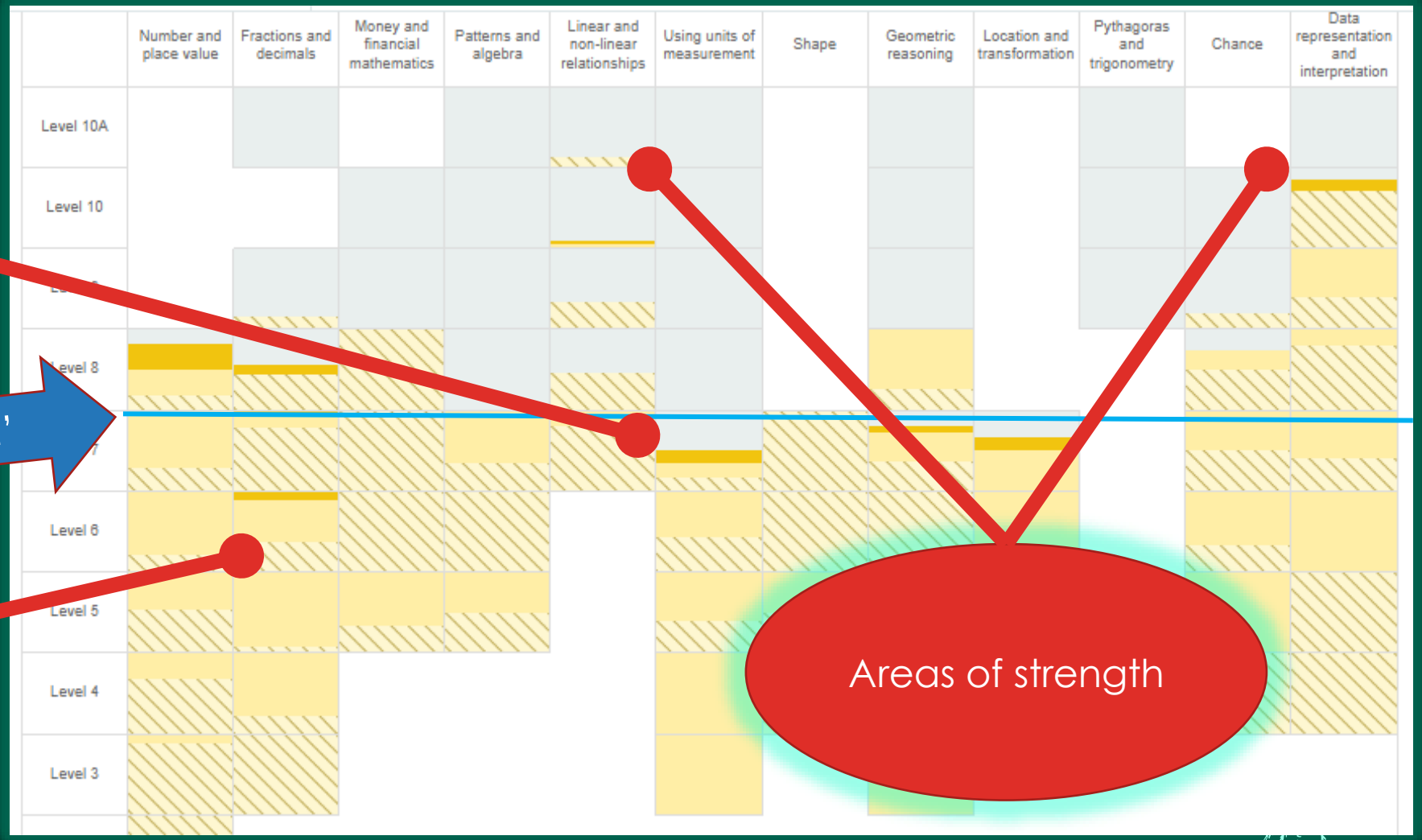
25/05/2022	200% Mastered 6 modules	100% Completed 6 of the 6 assigned modules.	100% Mastered 6 of the 6 completed modules.
16/06/2022	167% Mastered 5 modules	83% Completed 5 of the 6 assigned modules.	100% Mastered 5 of the 5 completed modules.
26/07/2022	133% Mastered 4 modules	83% Completed 5 of the 6 assigned modules.	80% Mastered 4 of the 5 completed modules.

Learning Activities Completed

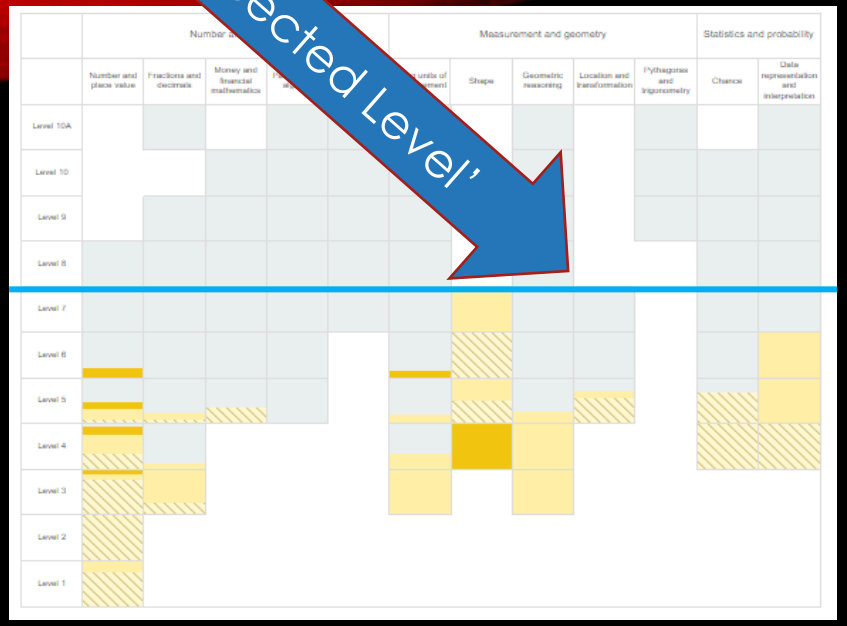
Completed	Name	Level	Strand	Substrand	Status
10/08/2022	Vertically Opposite Angles	6	Measurement and geometry	Geometric reasoning	Mastered
10/08/2022	Estimating Multiplication by Rounding	5	Number and algebra	Number and place value	Current
09/08/2022	Module time with teacher: Range, Mode and Median				
09/08/2022	Range, Mode and Median	7	Statistics and probability	Data representation and interpretation	Mastered
09/08/2022	Negative Numbers on the Number Line	6	Number and algebra	Number and place value	Mastered
02/08/2022	Module time with teacher: Decimal Addition and Subtraction				
02/08/2022	Decimal Addition and Subtraction	6	Number and algebra	Fractions and decimals	Mastered

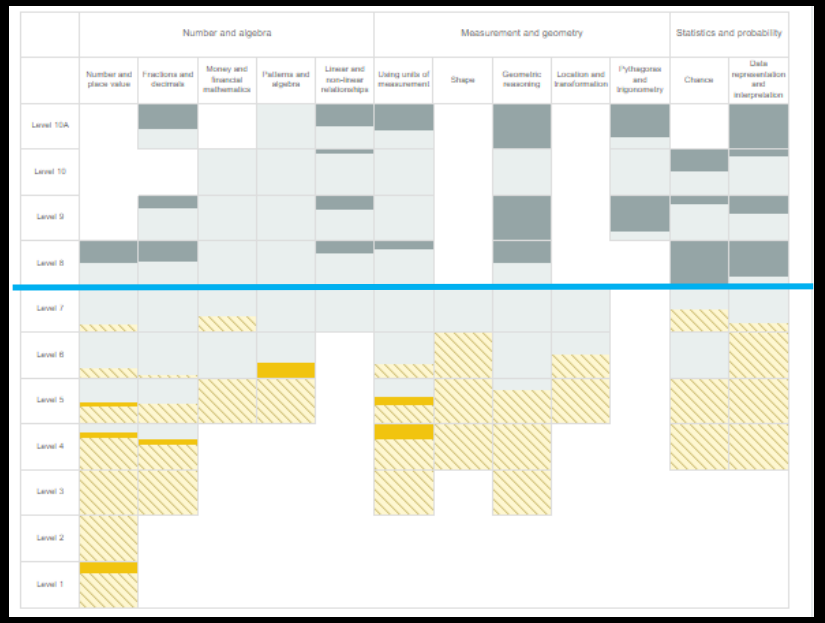
PERSONALISED DATA

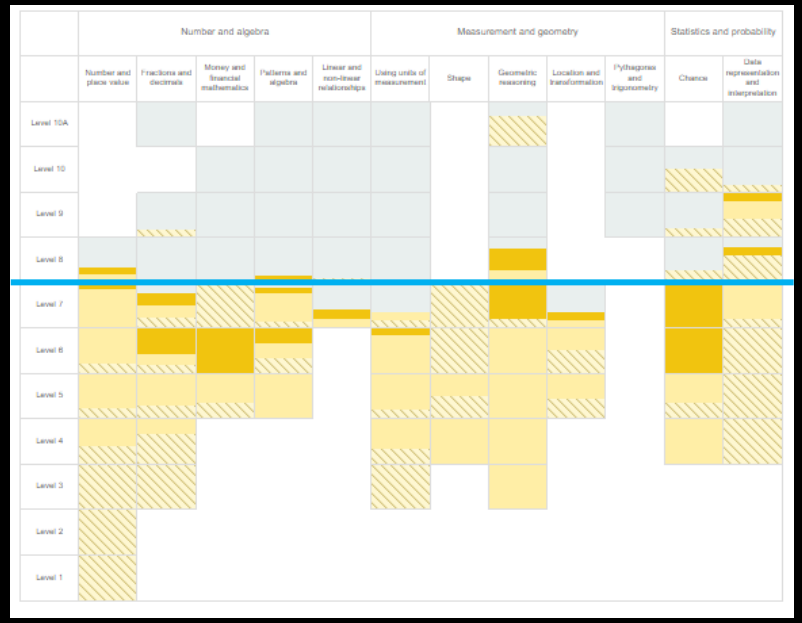
- Year 7 student



PERSONALISED DATA







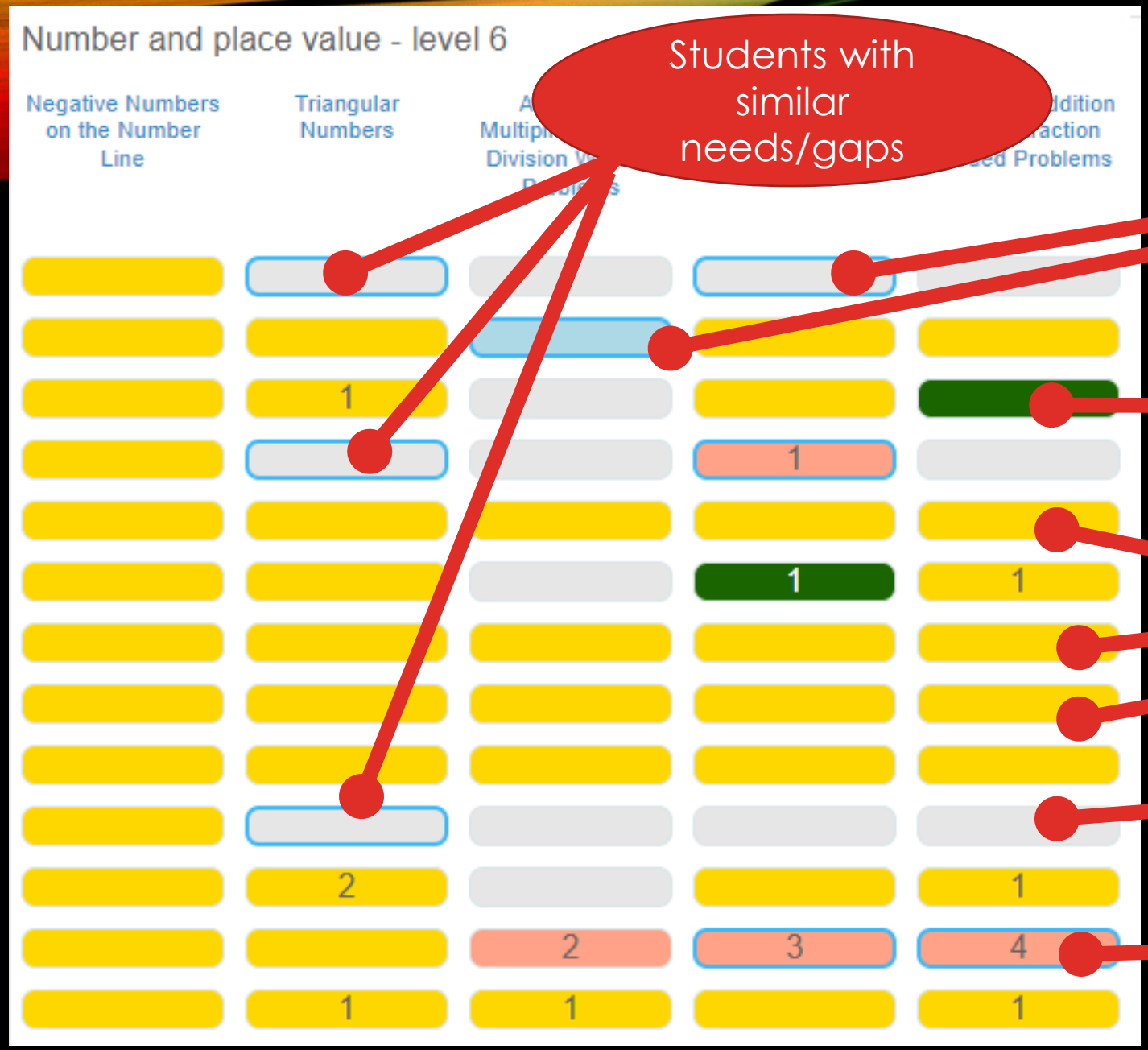
- Our students are individuals – we can now treat them as such

One class 3 vastly different students

Curriculum grid legend:

- Prior learning from diagnostics
- Previous years' learning
- Current years' learning
- Curriculum not yet diagnosed
- Not yet mastered

GROUP DATA


Number and place value - level 6
Negative Numbers on the Number Line
Triangular Numbers
Students with similar needs/gaps
Modules available to learn
Recently Completed
Completed the level
Gaps in knowledge
Multiple attempts

THINKING POINTS:

In a sample class we have students with a learning level that ranges from 3.5 to 8.5

That is the same as having an "average" Year 4 student in a class with an "average" Year 9 student – and all years in between

- How do you teach to that difference?
- How do both students get challenged appropriately?
- How do you meet their learning needs?

USING THE DATA

Modules available to individual class members

- (Number)

Wilma	7	Adding and Subtracting Negative Integers	7
Wilma	7	Estimating Multiplication by Rounding	5
Wilma	7	Multiplying and Dividing Integers	8
Wilma	7	Indices	7
Fred	7	Multiplying Large Numbers by One-Digit Nun	5
Fred	7	Short Division	5
Fred	7	Column Subtraction with a Single Trade	4
Fred	7	Divisibility Rules	5
Fred	7	Triangular Numbers	6
Fred	7	Column Subtraction with Multiple Trades	4
Fred	7	Square Numbers	6
Fred	7	Comparing and Ordering Integers	7

Barney	7	Operating with Rational Numbers	8
Barney	7	Adding and Subtracting Rational Numbers	8

USING THE DATA

Modules available to create small learning groups

- Similar are of need – concept and level
  - (Number)

Shakira	7	Estimating Multiplication by Rounding	5
Taylor	7	Estimating Multiplication by Rounding	5
Brittney	7	Estimating Multiplication by Rounding	5

Charles	7	Advanced Addition and Subtraction Worded Pr	6
Camilla	7	Advanced Addition and Subtraction Worded Pr	6
William	7	Advanced Addition and Subtraction Worded Pr	6
Kate	7	Advanced Addition and Subtraction Worded Pr	6

Bruce	7	Indices	7
Elton	7	Indices	7
Elvis	7	Indices	7
Paul	7	Indices	7
Ringo	7	Indices	7

Justin	7	Adding and Subtracting Rational Numbers	8
Kanye	7	Adding and Subtracting Rational Numbers	8
Lil-BOB	7	Adding and Subtracting Rational Numbers	8

STUDENTS:

- Have greater access to learning improvement:
  - Teacher / Support staff
  - Module instructions
    - Video
    - Audio
  - Peers
- Working on tasks that are more aligned to their capabilities – challenging but ‘do-able’

STUDENT VOICE: A SAMPLE OF STUDENT RESPONSES

- I like that I do work that is new
- I like getting 100% growth
- I like getting new modules
- I like not doing work with the rest of the class that I can already do
- I like working on my own
- I like working in groups
- It can be boring
- Some modules are hard to understand
- Modules are too long
- Modules are too short
- Some modules are locked
- I don't like working in groups

TEACHER FEEDBACK: "POSITIVES":

- All students are able to achieve success
  - focus on growth and learning
- Greater awareness of student levels/capabilities/gaps
  - more accurate planning
- Chance to provide targeted assistance
  - individuals/small groups/classes
- Less wasted time
  - i.e. repeating a topic to a student who already knows it
- Students are working on concepts they are ready for
  - whether that is at Level 1 or 10A
- Develops independent learning habits
  - encourages different ways of seeking help rather than asking the teacher first,
  - summaries
  - self - reflection

TEACHER FEEDBACK: "NEGATIVES"

- Data driven,
  - doesn't automatically take into account special circumstances
    - i.e. absences through illness, personal situations
- Once a module is mastered, students may not see that concept again for a long time and forget how to do it
- Can be text heavy
  - can be challenging for students with low literacy levels
- Lots of screen time on a computer

TEACHER FEEDBACK: "HOW DO YOU TEACH 'DIFFERENTLY' USING MATHS PATHWAY?"

- Have a better knowledge of student strengths and areas of needs
- More small group sessions - specific concept
- More individualised lessons and groupings
- More individual check ins to discuss results and areas of concern or success
- Greater awareness and confidence in knowing what a student's level is
- Students are always working on work at their level
- Able to give students work that is relevant to their skills/knowledge

GOING FORWARD: MATHS PATHWAY – 'UPDATES'

Post 2020/21 lockdown/home schooling /part time school world we have identified that students have a range of gaps in their mathematical knowledge.

- We have also reviewed and will continue to review how we implement MP including:
  - Use of data
  - Teacher skill/knowledge
  - Implementation of lessons

SOME OF THE CHANGES WE HAVE MADE:

- Greater consistency across Year levels
- Greater focus on Explicit Teaching (SOLAR)
  - Teacher and modules
- Teachers are sharing skills/knowledge
  - 'Using features of the program'
- Better planning
  - Using data more consistently/deeply
  - Modules are chosen to close gaps in student learning
    - Open future learning 'chains'
- More small group work

SOME OF THE CHANGES WE HAVE MADE:

- Working to use extra staff in room to better effect

- Structure of weekly program
  - Avoiding ‘doubles’ etc.
  - Variety - Hands-on/group tasks included – not just Maths Pathways

- Students have less ‘open’ choice for modules
  - less ‘shopping’
  - more personal/relevant

SOME FUTURE CHALLENGES:

- Better use of staff
  - Teacher, tutor, ES
- Making maths "less boring" (i.e. just on a computer)
- Quality use of 'hands-on' sessions
- Use of mini-lessons, grouping, individual sessions
- Continue to refine data harvesting skills
- Closing more learning gaps
- Aim for even more students to undertake higher level maths subjects in Years 11 & 12

CHANGING PRACTICES - NOW:

- **Consistency across teaching practice across Years 5-10**
  - 'upskilling staff'

- **Fortnightly Plan – 6 Math Pathways lesson & 4 Lessons focussed on current topic.**

- Explicit Instruction - all students during a lesson
  - mini lessons
  - grouping students on same modules
  - minimising time spent individually working.
  - modules

CHANGING PRACTICES - NOW:

- **Support in Classroom – ES/Tutor**
  - Upskill ES staff/non maths trained staff
  - focus on small groups rather than individual students – explicitly teach during sessions.
- Target students with lowest average growth rate.
- 'Push'/encourage high growth rate students

CHANGING PRACTICES - REST OF YEAR:

- Greater focus on student growth, output
- Review concepts 'mastered' on previous tests.
    - regular 'warm up activities' at the start of each module that revisit previously mastered concepts
    - Revision mini tests
- Consolidating grouping of students
- Further upskilling of staff

PRACTICES WE WILL WORK ON CHANGING / ADOPTING IN 2023

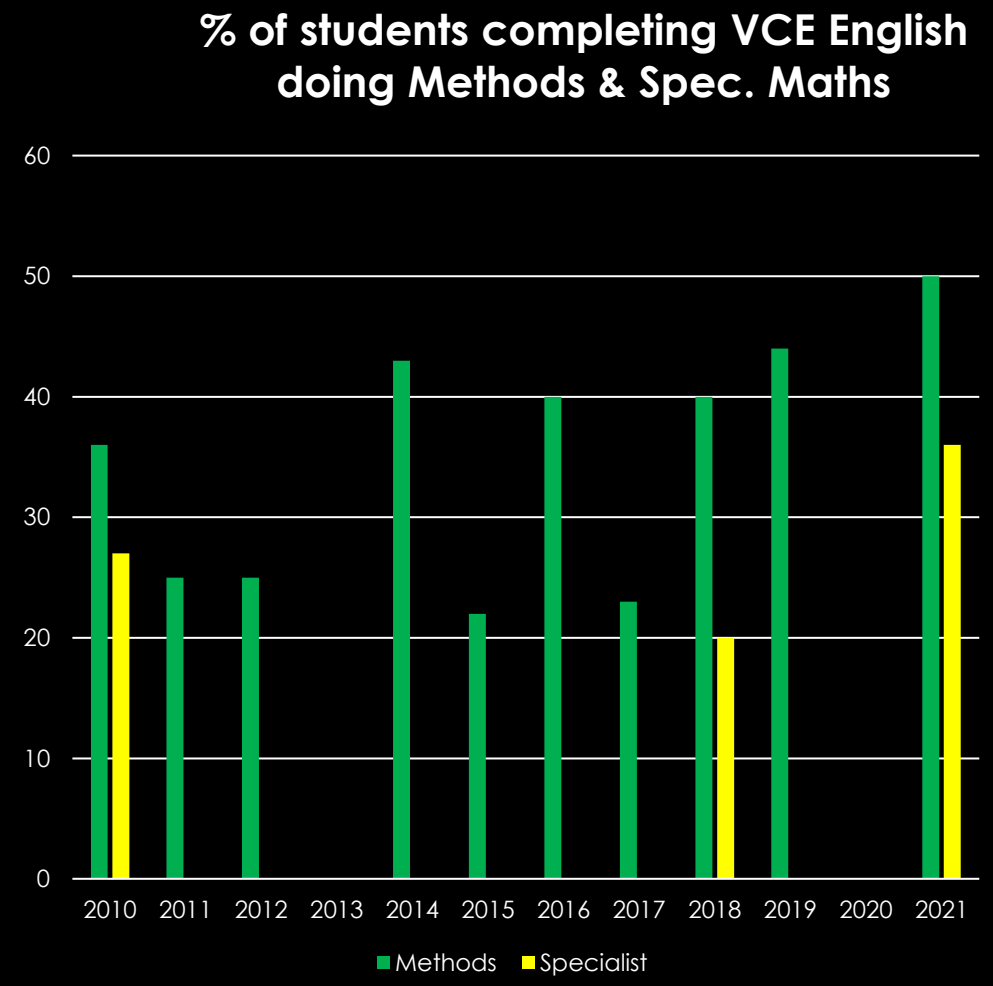
- Continue aims of rest of 2022
- Greater alignment of focus areas across year levels.
  - For example:
    - Term 1 Week 1-4 Number and Place Value/Real Numbers

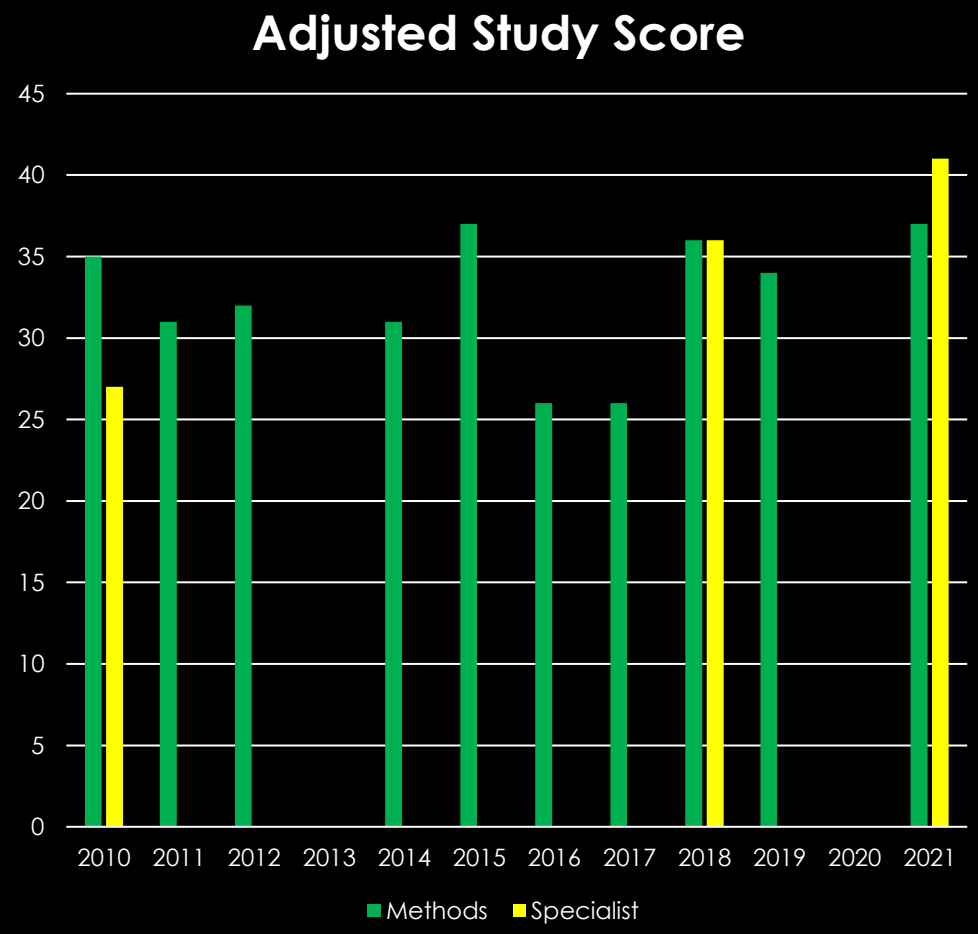
WHERE ARE WE HEADING?

- More students with a stronger knowledge base of maths
  - Less gaps

- More students trending towards undertaking and achieving stronger results in higher level maths subjects in Years 11 & 12

WHERE ARE WE HEADING?





YEAR 5-10 MATHS AT EAST LODDON P-12 COLLEGE…

- Access to more personalised data than ever before
  - not just a 'one size fits all' approach
- Teachers are better informed, know the student's skills, areas of need
  - More accurate and personal data
  - Better planning, lesson content, improved delivery
- Student learning gaps are being identified and targeted
- Students are working on tasks more closely linked to a specific area of need than ever before – being challenged more
- Students are completing a greater level of targeted, personalised work

FINALLY…..

2022 – Annual Implementation Plan - Mathematics:

"*Implement a* ***sequenced*** *numeracy curriculum with a focus on* ***explicit*** *teaching that* ***differentiates*** *and* ***challenges*** *students at their* ***point of need***"

THANK YOU.

- Any questions?